



Maricopa County

Air Quality Department

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JUL 20 2015

MARICOPA COUNTY
AIR QUALITY DEPARTMENT

MD
Maricopa County Air Quality Department
1001 N Central Ave, Suite 125, Phoenix, AZ 85004
Phone (602) 506-6010 Fax (602) 372-0587
AQPermits@mail.maricopa.gov

NON-TITLE V PERMIT - MINOR MODIFICATION APPLICATION

NOTIFICATION OF MINOR MODIFICATION AT A CURRENTLY PERMITTED FACILITY

ALL APPLICANTS MUST COMPLETE THE ENTIRE APPLICATION

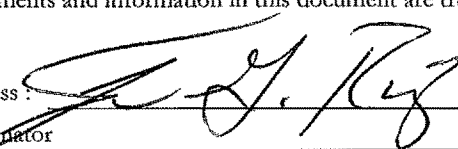
Per Rule 220, Section 405 and Section 406, this notification must be submitted for a currently permitted facility for a minor permit revision. This notification is not required for changes in work schedules or relocation of equipment for similar use within a permitted facility.

Important: Please note that email will be our primary means for routine communication with you, unless you do not have an email account. Please be sure that your email address is entered correctly.

Submit this notification prior to making the modifications. If confidentiality is claimed pursuant to ARS §49-487, a fully completed application with confidential information clearly identified along with a separate copy of the application for public review without the confidential information and a written justification for the confidentiality claimed must be submitted. Complete both sides by typing or printing legibly. A filing fee of \$200.00 must accompany your application (make checks payable to MCAQD). If the application is submitted as a result of receiving a notice of violation (NOV), an additional \$100.00 late fee must accompany the application. Before the permit is issued, the Permittee will be billed for all permit processing time required for a billable permit action at a rate of \$150.00 per hour, adjusted annually under Department Rule 280 (Fees), §304. An annual administrative fee will also be charged per Rule 280, §302.2. For questions regarding billing, call (602) 372-1071.

Business Name: Hickman's Egg Ranch, Inc.	Existing Air Quality Permit Number for this Site: 040136 - 408551
Address of Site: 32425 West Salome Hwy.	
City: Arlington	State: AZ Zip Code: 85322 Telephone At Site: 623-386-1333
Contact Person at Site: Francisco G. Ruiz (Frank)	
Mailing Address: 224 North 4th Street	
City: Buckeye	State: AZ Zip Code: 85326 Telephone: 623-872-2341
Fax: 623-474-6392	E-mail: fruiz@hickmanseggs.com

Based on information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate, and complete.

Date: July 17, 2015 Signature of owner or responsible official of business: 
Type or print name and title: Francisco G. Ruiz/Safety & Health Coordinator

Do Not Write In This Space.

Reviewed by: _____ Date: _____

☐ Approved ☐ Denied

Reason for denial: _____

For Office Use Only	Date Received: _____	Log Number: _____
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1. Narrative description of the proposed modification :

Addition of Rotary Dryer with Baghouse for manure drying operation, and the installation of a 15,000 gallons propane tank. A request for the removal of the animal feeding production operations requirements from the Air Quality permit. The animal feeding operations are covered by the ADEQ BMP's.

Also, please see attachments

2. Provide a list of equipment and emission control devices which will be installed or modified :

Assigned Equipment Number	Describe each Piece of Equipment Include Make & Model	Date of Installation or Modification	How Many	HP, KVA Gallons or Other Ratings (Specify Units)	Exhaust - Vent to Air	Exhaust - Vent to Control (Identify)		
	Propane Tank, 15,000 Gallons	July, 2015	1	15MMBTU		Baghouse	Add Cell	Remove Cell

3. Material List : List all materials handled, stored, processed, used, mixed, treated, or emitted. Include chemicals, mixtures, resins, cleaning compounds, etc., in this list. Identify each in sufficient detail and provide material safety data sheets (MSDS)

Material	Annual Usage or Throughput	Chemical Composition (% by weight)	Equipment Number in Which Used		
Propane HD-5	341,120 gallons	96.7%		Add Cell	Remove Cell

4. Describe Control Devices

Type of Device	Name/ID	Gas Flow Rate SCFW	Liquid Flow Rate Gal/Min	Control Efficiency (% Weight)		
Baghouse				99.5%		
					Add Cell	Remove Cell

5. Materials reclaimed or shipped as waste :

None

If applicable, complete the attached section Z-M.



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NON-TITLE V PERMIT - MINOR MODIFICATION APPLICATION

SECTION Z-M

AIR POLLUTANT EMISSIONS

Provide a summary of the projected actual air emissions on an annual basis for the entire site in the following summary tables. Attach detailed calculations to support the figures. **If supporting calculations are not included with the application, the application will be deemed incomplete.**

Provide a summary of the actual air emissions on an annual basis for the following three columns:

- (i) Emissions to be released from only the equipment and affected processes described on this notification
- (ii) The entire site prior to the modification of the equipment and processes described in (i) above.
- (iii) The entire site including the emissions identified in (i) above. Normally, this column will be the sum of columns (i) and (ii).

Pollutant	Column (i)	Column (ii)	Column (iii)		
Carbon Monoxide (CO)	1.28 tpy	0	1.28 tpy		
Oxides Of Nitrogen (NO _x)	2.22 tpy	0	2.22 tpy		
Oxides Of Sulfur (SO _x)	Negligible	0	Negligible		
Particulates Of 10 Microns Or Smaller (PM ₁₀)	Negligible	0	Negligible		
Total Suspended Particulates (TSP), Including PM ₁₀	Negligible	0	Negligible		
Volatile Organic Compounds (VOCs) ¹	0.17 tpy	0	0.17 tpy		
Federal hazardous air pollutants (list each one separately):					
				Add Column	Remove Column

¹ VOCs are defined by EPA at: http://www.epa.gov/ttn/naaqs/ozone/ozonotech/def_voc.htm

Attach detailed calculations to support the figures in the above summary tables. Do not include the emissions from motor vehicles.

Include the emissions from stationary sources, portable sources, test areas, experimental facilities, evaporative losses, storage and handling losses, fuel loading and unloading losses, etc. Specifically identify the following in detailed calculations:

1. Emissions From Each Point Source And Each Stack
2. Capture Efficiencies
3. Control Efficiencies
4. Overall Efficiencies
5. Fugitive Emissions
6. Non-point (area) Emissions

For particulate (dust) emissions, describe the types of particulates being emitted and the quantities of emissions for each type. Identify and quantify each and every type of VOC that is included in the above summary tables. Whenever a material is identified by a trade name, also provide its generic name and its chemical abstract service (CAS) number.

Help sheets for calculating emissions from specific industries or processes can be obtained at:

http://www.maricopa.gov/aq/divisions/planning_analysis/emissions_inventory/instructions.aspx

If you need help completing the application package, please see our website or contact 602-506-5102.

<http://www.maricopa.gov/aq>



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FEDERAL HAZARDOUS AIR POLLUTANTS LIST

(Federal Clean Air Act, Title I, Section 112(b))

CAS No.	Chemical name	CAS No.	Chemical name	CAS No.	Chemical name	Chemical name
75070	Acetaldehyde	121697	N,N-Diethyl aniline (N,N-Dimethylaniline)	101688	Methylene diphenyl diisocyanate (MDI)	Antimony Compounds
60355	Acetamide	64675	Diethyl sulfate	101779	4,4'-Methylenedianiline	Arsenic Compounds (inorganic including arsine)
75058	Acetonitrile	119904	3,3-Dimethoxybenzidine	91203	Naphthalene	Beryllium Compounds
98862	Acetophenone	60117	Dimethyl aminoazobenzene	98953	Nitrobenzene	Cadmium Compounds
53963	2-Acetylaminofluorene	119937	3,3'-Dimethyl benzidine	92933	4-Nitrobiphenyl	Chromium Compounds
107028	Acrolein	79447	Dimethyl carbamoyl chloride	100027	4-Nitrophenol	Cobalt Compounds
79061	Acrylamide	68122	Dimethyl formamide	79469	2-Nitropropane	Coke Oven Emissions
79107	Acrylic acid	57147	1,1-Dimethyl hydrazine	684935	N-Nitroso-N-methylurea	Cyanide Compounds[1]
107131	Acrylonitrile	131113	Dimethyl phthalate	62759	N-Nitrosodimethylamine	Glycol ethers[2]
107051	Allyl chloride	77781	Dimethyl sulfate	59892	N-Nitrosomorpholine	Lead Compounds
92671	4-Aminobiphenyl	534521	4,8-Dinitro-o-cresol, and salts	56382	Parathion	Manganese Compounds
62533	Aniline	51265	2,4-Dinitrophenol	82688	Pentachloronitrobenzene (Quintobenzene)	Mercury Compounds
90040	o-Anisidine	121142	2,4-Dinitrotoluene	87865	Pentachlorophenol	Fine mineral fibers[3]
1332214	Asbestos	123911	1,4-Dioxane (1,4-Diethyleneoxide)	108952	Phenol	Nickel Compounds
71432	Benzene (including benzene from gasoline)	122667	1,2-Diphenylhydrazine	106503	p-Phenylenediamine	Polycyclic Organic Matter[4]
92875	Benidine	106898	Epichlorohydrin (1-Chloro-2,3-epoxypropane)	75445	Phosgene	Radionuclides (including radon)[5]
98077	Benzotrithloride	106887	1,2-Epoxybutane	7803512	Phosphine	Selenium Compounds
100447	Benzyl chloride	140885	Ethyl acrylate	7723140	Phosphorus	
92524	Biphenyl	100414	Ethyl benzene	85449	Phthalic anhydride	
117817	Bis(2-ethylhexyl)phthalate (DEHP)	51796	Ethyl carbamate (Urethane)	1338363	Polychlorinated biphenyls (Aroclors)	
542881	Bis(chloromethyl)ether	75003	Ethyl chloride (Chloroethane)	1120714	1,3-Propane sultone	
75252	Bromoform	106934	Ethylene dibromide (Dibromoethane)	57578	beta-Propiolactone	
106990	1,3-Butadiene	107082	Ethylene dichloride (1,2-Dichloroethane)	123386	Propionaldehyde	
156627	Calcium cyanamide	107211	Ethylene glycol	114261	Propoxur (Baygon)	
133062	Captan	151564	Ethylene imine (Aziridine)	78875	Propylene dichloride (1,2-Dichloropropane)	
63252	Carbaryl	75218	Ethylene oxide	75569	Propylene oxide	
75150	Carbon disulfide	96457	Ethylene thiourea	75558	1,2-Propylenimine(2-Methyl aziridine)	
56235	Carbon tetrachloride	75343	Ethylidene dichloride (1,1-Dichloroethane)	91225	Quinoline	
463581	Carbonyl sulfide	50000	Formaldehyde	106514	Quinone	
120809	Catechol	78448	Heptachlor	100425	Styrene	
33904	Chloramben	118741	Hexachlorobenzene	96093	Styrene oxide	
57749	Chlordane	87683	Hexachlorobutadiene	1746016	2,3,7,8-Tetrachlorodibenzo-p-dioxin	
7782505	Chlorine	77474	Hexachlorocyclopentadiene	79345	1,1,2,2-Tetrachloroethane	
79118	Chloroacetic acid	67721	Hexachloroethane	127184	Tetrachloroethylene (Perchloroethylene)	
532274	2-Chloroacetophenone	822060	Hexamethylene-1,6-diisocyanate	7550450	Titanium tetrachloride	
108907	Chlorobenzene	680319	Hexamethylphosphoramide	108883	Toluene	
510156	Chlorobenzilate	110543	Hexane	95807	2,4-Toluene diamine	
67863	Chloroform	302012	Hydrazine	584849	2,4-Toluene diisocyanate	
107302	Chloromethyl methyl ether	7647010	Hydrochloric acid	95534	o-Toluidine	
126998	Chloroprene	7664393	Hydrogen fluoride (Hydrofluoric acid)	8001352	Toxaphene (chlorinated camphene)	
1319773	Cresols/Cresylic acid (isomers and mixture)	123319	Hydroquinone	120821	1,2,4-Trichlorobenzene	
95487	o-Cresol	78591	Isophorone	79005	1,1,2-Trichloroethane	
108394	m-Cresol	58999	Lindane (all isomers)	79016	Trichloroethyleneprocessing	
106445	p-Cresol	108316	Maleic anhydride	95954	2,4,5-Trichlorophenol	
98828	Cumene	67561	Methanol	88062	2,4,6-Trichlorophenol	
94757	2,4-D, salts and esters	72435	Methoxychlor	121448	Triethylamine	
3547044	DDE	74839	Methyl bromide (Bromomethane)	1582098	Trifluralin	
334883	Diazomethane	74873	Methyl chloride (Chloromethane)	540841	2,2,4-Trimethylpentane	
132649	Dibenzofurans	71556	Methyl chloroform (1,1,1-Trichloroethane)	108054	Vinyl acetate	
98128	1,2-Dibromo-3-chloropropane	60344	Methyl hydrazine	593602	Vinyl bromide	
84742	Dibutylphthalate	74884	Methyl iodide (Iodomethane)	75014	Vinyl chloride	
106467	1,4-Dichlorobenzene(p)	108101	Methyl isobutyl ketone (Hexone)	75354	Vinylidene chloride (1,1-Dichloroethylene)	
91941	3,3-Dichlorobenzidine	624838	Methyl isocyanate	1330207	Xylenes (isomers and mixture)	
111444	Dichloroethyl ether (Bis(2-chloroethyl)ether)	80626	Methyl methacrylate	95476	o-Xylenes	
542756	1,3-Dichloropropene	1634044	Methyl tert butyl ether	108383	m-Xylenes	
62737	Dichlorvos	101144	4,4-Methylene bis(2-chloroaniline)	106423	p-Xylenes	
111422	Diethanolamine	75092	Methylene chloride (Dichloromethane)			

For all listings above which contain the word "compounds" and for glycol ethers, unless otherwise specified, these listings are defined as including any unique chemical substance that contains the named chemical as part of that chemical's infrastructure.

[1] X'CN where X = H' or any other group where a formal dissociation may occur. For example KCN or Ca(CN)2.

[2] Includes mono- and di- ethers of ethylene glycol, diethylene glycol and triethylene glycol R(OCH2CH2)n-OR' where:

n = 1, 2 or 3

R = alkyl C7 or less, or phenyl or alkyl substituted phenyl

R' = H, or alkyl C7 or less, or carboxylic acid ester, sulfate, phosphate, nitrate, or sulfonate.

[3] Includes mineral fiber emissions from facilities manufacturing or glass, rock or slag fibers or other mineral derived fibers of average diameter one (1) micrometer or less.

[4] Includes organic compounds with more than one (1) benzene ring and which have a boiling point greater than or equal to 100°C.

[5] A type of atom which spontaneously undergoes radioactive decay

Emissions Calculations
Hickman's Egg Ranch
32425 W. Salome Highway
Arlington, AZ 85322

1. Propane Cas # 74-98-6
Molar Mass 44.1 g/mol
Formula C₃H₈
Density 493.00 kg/m³ 4.24 lb/gal
Specific heat capacity 73.60 J K⁻¹ mol⁻¹ 21,564 BTU/lb 91,500 BTU/gallon
2. Rotary Dryer Burner 15 MMBtu/hr
3. Propane Tank 15,000 lb or 63,600 gallons or can operate 388 hours per tank
4. PTE = 8,760 hours (24/7/265) Estimated Hours 2,080 Work Week 8 hour days/5 days week/ 52 weeks year
5. Estimated Emissions Based on Manufacturers Specifications and Huston Environmental Services confirmation using AP-42 EF, updated July 2008 Section 1.5.

	CO	NOx	SOx	PM-10	TSP	VOCs
EF lb/1000 gallon	7.5	13	0.01	0.7	0.7	1.0
EF lb/MMBTU	0.082	0.142	0.00016	0.008	0.008	0.011
Emissions/Hourly lb/hr	1.23	2.13	0.00	0.11	0.11	0.16
Work Week-TPY	1.28	2.22	0.00	0.12*	0.12 *	0.17
PTE-TPY	5.39	9.34	0.01	0.5	0.5	0.72

lb/MMBTU pounds per Million British Thermal Units

lb/hr pounds per hour

TPY tons per year

- Emissions calculations for PM-10 and TSP does not consider baghouse efficiency. Emissions are negligible after calculating baghouse efficiency and are reported as such on Section Z-M of the Minor Permit Modification Form.

6. Calculation for conversion from BTU per gallon to lb/MMBTU
91,500 BTU/Gallon of Propane. Burner rate at 15MMBTU/hr
Sulfur content at 0.1 grains/100cf

**Emissions Calculations
Hickman's Egg Ranch
32425 W. Salome Highway
Arlington, AZ 85322**

7. It is noted as part of this minor permit modification, the facility will report emissions based on propane fuel-consumption for the rotary dryer. Other than inspections and recordkeeping, per agreement with the Maricopa County Air Quality Department (MCAQD), no performance testing or other emissions-based testing will be required to document compliance with this minor permit modification.
8. It is noted the facility is not required to report emissions from other source categories (i.e. manure and its components) unless the source category is independently subject to the Clean Air Act.
9. It is noted that MCAQD views the rotary dryer as part of the facility's waste management operations for purposes of manure drying, of which, such operations are regulated by the Arizona Department of Environmental Quality (ADEQ). The associated baghouse (and its fines) for the rotary dryer will be regulated by the ADEQ through Agricultural Best Management Practices (BMPs). The ADEQ will establish BMPs for the baghouse outside of this permit.



1414 Riley Industrial Dr, P.O. Box 1027, Moberly, Missouri 65270 USA
 Telephone: 660.263.7575 International: +1.660.263-7575
 Fax: 660.263.2526 E-mail: wwrequip@wwrequip.com
 www.wwrequip.com

Emissions Estimation: 13647 Rev. 2

15 MMBtu/hr Propane Burner

Emissions calculated by Vulcan® Systems for Hickman Egg Ranch are included in Table 1. These emissions have been calculated using the USA EPA method AP-42 for External Combustion Sources. Values are not a guarantee of emissions and do not reflect actual running data. Actual emissions will be affected by various factors including furnace pressures, quality of the fuel, running time of the plant, feed material properties, etc. Vulcan® and its parent company Worldwide Recycling Equipment Sales, LLC recommend consulting a certified environmental engineer when filling out any permits relating to any Vulcan® Thermal Desorption or Drying Systems.

Potential Emission Rates ¹					
NO _x ² Tons/year ⁸	CO ³ Tons/year ⁸	SO ₂ ⁴ Tons/year ⁸	TOCs ⁵ Tons/year ⁸	PM ⁶ Tons/year ⁸	CO ₂ ⁷ Tons/year ⁸
2.98	1.72	0.00	0.23	0.16	2,868.85
PPM ⁹	PPM ⁹	PPM ⁹	PPM ^{9, 10}	PPM ⁹	PPM ⁹
119.91	113.69	0.12	26.34	N/A	119,262.30
lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
2.13	1.23	0.00	0.16	0.11	2,049.18

¹Considering firing a propane burner at a maximum rate of 15 MMBtu/hr

²Expressed as NO_x and calculated using an emission factor of 3.25 lb/10³ gallon. EPA AP-42 uses an EF of 13 lb/10³ gallon for NO_x

³Calculated using an emission factor of 7.5 lb/10³ gallon

⁴Considering a Sulfur content of 0.18 grains/100 ft³ of propane vapor

⁵Total organic compounds calculated using an emission factor of 1 lb/10³ gallon

⁶Total particulate matter calculated using an emission factor of 0.7 lb/10³ gallon

⁷Calculated using an emission factor of 12,500 lb/10³ gallon

⁸Year defined as operating 8 hours/day, 7 days/week, and for 50 weeks/year

⁹Calculated at 3% O₂ in dry flue gases

¹⁰PPM of TOCs expressed as methane

All calculations are based on the stated assumptions; good engineering practices have been followed to optimize the design for these assumptions/conditions. Deviations in environmental conditions, feed composition/throughput, changes to construction of equipment, etc. will change these figures. Do not reproduce.

LIQUEFIED PETROLEUM GAS (LPG) COMBUSTION EMISSIONS CALCULATOR - REVISION D 2/1/2010 - OUTPUT SCREEN



Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

SOURCE / FACILITY / USER INPUT SUMMARY (FROM INPUT SCREEN)

COMPANY:	Facility Name, Inc.	FACILITY ID NO.:	01/12/00999
EMISSION SOURCE DESCRIPTION:	15 MMBTU/HR FIRED BOILER	PERMIT NUMBER:	9999R02
EMISSION SOURCE ID NO.:	ES-1	FACILITY CITY:	ANYTOWN
SPREADSHEET PREPARED BY:	Your Name	FACILITY COUNTY:	ANYCOUNTY
ACTUAL FUEL THROUGHPUT:	341,000 GAL/YR	FUEL HEAT VALUE:	91,600 BTU/Gal
POTENTIAL FUEL THROUGHPUT:	340,611 GAL/YR	HHV USED FOR GHGs	0.091 mm BTU/Gal
REQUESTED MAX. FUEL THRPT:	340,611 GAL/YR	BOILER TYPE:	INDUSTRIAL
METHOD USED TO COMPUTE ACTUAL GHG EMISSIONS:		TIER 1: DEFAULT HIGH HEAT VALUE AND DEFAULT EF	
CARBON CONTENT USED FOR GHGS (kg C/gal):		CARBON CONTENT NOT USED FOR CALCULATION TIER CHOSEN	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION

AIR POLLUTANT EMITTED	ACTUAL EMISSIONS		POTENTIAL EMISSIONS				EMISSION FACTOR	
	(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)		lb/mmBtu	
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	uncontrolled	controlled
PARTICULATE MATTER (PM)	0.11	0.12	0.11	0.50	0.11	0.12	0.008	0.008
PARTICULATE MATTER<10 MICRONS (PM ₁₀)	0.11	0.12	0.11	0.50	0.11	0.12	0.008	0.008
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})	0.11	0.12	0.11	0.50	0.11	0.12	0.008	0.008
SULFUR DIOXIDE (SO ₂)	0.00	0.00	0.00	0.01	0.00	0.00	1.09E-04	1.09E-04
NITROGEN OXIDES (NO _x)	2.13	2.22	2.13	9.34	2.13	2.22	0.142	0.142
CARBON MONOXIDE (CO)	1.23	1.28	1.23	5.39	1.23	1.28	0.082	0.082
VOLATILE ORGANIC COMPOUNDS (VOC)	0.16	0.17	0.16	0.72	0.16	0.17	0.011	0.011

TOXIC / HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION

TOXIC / HAZARDOUS AIR POLLUTANT	CAS NUMBER	ACTUAL EMISSIONS		POTENTIAL EMISSIONS				EMISSION FACTOR	
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)		lb/mmBtu	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	uncontrolled	controlled

TOXIC AIR POLLUTANT EMISSIONS INFORMATION (FOR PERMITTING PURPOSES)

EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS						EMISSION FACTOR	
						lb/mmBtu	
TOXIC AIR POLLUTANT	CAS Num.	lb/hr	lb/day	lb/yr		uncontrolled	controlled

GREENHOUSE GAS POLLUTANT EMISSIONS INFORMATION (FOR EMISSION INVENTORY PURPOSES)

GHG - POTENTIAL TO EMIT
NOT BASED ON EPA MRR METHOD

PROPANE	ACTUAL EMISSIONS			POTENTIAL EMISSIONS - utilize max heat input capacity and EPA MRR Emission Factors		POTENTIAL EMISSIONS With Requested Emission Limitation - utilize requested fuel limit and EPA MRR Emission Factors	
	EPA MRR CALCULATION METHOD: TIER 1						
GREENHOUSE GAS EMITTED	metric tons/yr	metric tons/yr, CO ₂ e	short tons/yr	short tons/yr	short tons/yr, CO ₂ e	short tons/yr	short tons/yr, CO ₂ e
CARBON DIOXIDE (CO ₂)	1,907.17	1,907.17	2,102.29	8,902.08	8,902.08	2,113.74	2,113.74
METHANE (CH ₄)	9.31E-02	1.95E+00	1.03E-01	4.35E-01	9.13E+00	1.03E-01	2.17E+00
NITROUS OXIDE (N ₂ O)	1.86E-02	5.77E+00	2.05E-02	8.69E-02	2.69E+01	2.06E-02	6.40E+00
TOTAL		1,914.89		TOTAL	8,938.15	TOTAL	2,122.30

NOTE: CO₂e means CO₂ equivalent.

NOTE: The DAQ Air Emissions Reporting Online (AERO) system requires short tons be reported. The EPA MRR requires metric tons be reported.

LIQUEFIED PETROLEUM GAS (LPG) COMBUSTION EMISSIONS CALCULATOR - REVISION D 2/1/2010 - INPUT SCREEN



Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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Directions: Enter and select information in the boxes in the column on the right:

FIELDS

COMPANY NAME:
FACILITY ID NUMBER:
PERMIT NUMBER
FACILITY CITY:
FACILITY COUNTY:
SPREADSHEET PREPARED BY:

SELECTIONS

Facility Name, Inc.
01/12/00999
9999R02
ANYTOWN
ANYCOUNTY
Your Name

EMISSION SOURCE ID NO.:
MAXIMUM HEAT INPUT (MILLION BTU PER HOUR):

ES-1
15.00 MMBTU/HR

TYPE OF BOILER:

INDUSTRIAL

(TYPE OVER NUMBER AT RIGHT IF YOU HAVE SITE SPECIFIC DATA)

These fuel properties
are not used for GHG
calculations. See
below for GHG

FUEL HEATING VALUE (BTU/GAL):
PERCENT PROPANE:
PERCENT BUTANE:
SULFUR CONTENT:

91,600 BTU/GAL
96.80 %
3.20 %
0.1 GRAINS/100 FT³

DEFAULT VALUES AS FOLLOWS:

90,500 BTU/GAL
97.50 %
2.50 %
0.1 GRAINS/100 FT³

ANNUAL HOURS OF OPERATION:

2080 HOURS

8760 HOURS

ACTUAL YEARLY FUEL USAGE (GALLONS PER YEAR):
CALCULATED POTENTIAL YEARLY USAGE (GALLONS PER YEAR)
REQUESTED ANNUAL LIMITATION (GALLONS PER YEAR)
(TYPE OVER AS NECESSARY - DEFAULT IS POTENTIAL)

341,000 GAL/YR
340,611 GAL/YR
340,611 GAL/YR

NOX CONTROL IF PRESENT (DEFAULT IS ZERO)

0 %

0 %

ADDITIONAL INFORMATION FOR GREENHOUSE GAS (GHG) EMISSIONS

ENTER CALCULATION TIER
from EPA Mandatory Reporting Rule (MRR) Subpart C -
www.epa.gov/climatechange/emissions/ghgrulemaking.html
NOTE: EF is "Emission Factor"

TIER 1: DEFAULT HIGH HEAT VALUE AND DEFAULT EF

ENTER FUEL TYPE (PROPANE or BUTANE or LPG)

PROPANE

SINCE TIER 3 IS NOT BEING USED,
FUEL CARBON CONTENT WILL NOT BE USED

2.6700 kg Carbon/gal

SINCE NOT USING TIER 2, THIS HHV IS NOT USED --
DEFAULT HHV (See below) IS USED

0.0800 mm Btu/gal

NOTE: When using TIER 1 or TIER 3, the above HHV will be overridden with the EPA DEFAULT HHV listed below:
DEFAULT VALUES BELOW FROM TABLE C-1, EPA MRR (<http://www.epa.gov/climatechange/emissions/ghgrulemaking.html>)
PROPANE 0.091 mm Btu/gal THIS VALUE WILL BE USED FOR GHG calculations- actual emissions
BUTANE 0.101 mm Btu/gal
LPG 0.092 mm Btu/gal

PROPANE DEFAULT HHV OF 0.091 mm Btu/gal THIS VALUE WILL BE USED FOR GHG calculations- actual emissions

CRITERIA AIR POLLUTANTS

POLLUTANT	BUTANE			
	INDUSTRIAL		COMMERCIAL	
	(LB/10 ³ GAL)	(LB/MMBTU)	(LB/10 ³ GAL)	(LB/MMBTU)
PM	0.8	0.008	0.8	0.008
SO ₂	0.009	8.824E-05	0.009	8.824E-05
NO _x	15	0.147	15	0.147
CO	8.4	0.082	8.4	0.082
TOC	1.1	0.011	1.1	0.011
FUEL	%	TRUE	3.20	TRUE
SIZE	MMBTU	TRUE	15.00	FALSE
		1	0.032	0
		CLASS= INDUSTRIAL		

POLLUTANT	PROPANE			
	INDUSTRIAL		COMMERCIAL	
	(LB/10 ³ GAL)	(LB/MMBTU)	(LB/10 ³ GAL)	(LB/MMBTU)
PM	0.7	0.008	0.7	0.008
SO ₂	0.01	1.093E-04	0.01	1.093E-04
NO _x	13	0.142	13	0.142
CO	7.5	0.082	7.5	0.082
TOC	1.0	0.011	1.0	0.011
FUEL	%	TRUE	96.80	TRUE
SIZE	MMBTU	TRUE	15.00	FALSE
		1	0.068	0
		CLASS= INDUSTRIAL		

ASSUMES ALL PM IS LESS THAN PM-10

S EQUALS THE SULFUR CONTENT EXPRESSED IN GR/100 FT3

ASSUMES A HEATING VALUE OF 91.5 MMBTU/1000 GAL FOR PROPANE AND 102 MMBTU/1000 GAL FOR BUTANE.

**VOC = NMTOC = TOC * (1-METHANE)

All emission factors are from AP-42 Section 1.5 revised 7/2008

SIZE CLASSIFICATION SUMMARY

mmBTU/hr	Classification
<10	COMMERCIAL
10-100	SMALL INDUSTRIAL*
>100	LARGE INDUSTRIAL*

* same factors used for Large and Small Industrial

GREENHOUSE GASES - Emission Factors from Tables C-1 and C-2

EPA Mandatory Reporting Rule, <http://www.epa.gov/climatechange/emissions/downloads09/GHG-MRR-FinalRule.pdf>

POLLUTANT	PROPANE	BUTANE	LPG
	COMBUSTION - Any Unit (kg/MMBTU)	COMBUSTION - Any Unit (kg/MMBTU)	COMBUSTION - Any Unit (kg/MMBTU)
CO ₂	61.460	65.150	62.980
CH ₄	0.003	0.003	0.003
N ₂ O	0.0006	0.0006	0.0006

EMISSION FACTORS ARE BASED ON FUEL CHOSEN from INPUT TAB

POLLUTANT	PROPANE
	COMBUSTION - Any Unit (kg/MMBTU)
CO ₂	61.460
CH ₄	0.003
N ₂ O	0.0006

CALCULATED FROM INPUT SCREEN VALUES

	ACTUAL	POTENTIAL	REQUESTED/PERMITTED/LIMITED POTENTIAL
HOURLY MMBTU:	15.00	15.00	15.00
DAILY MMBTU:	360	360	360
YEARLY MMBTU:	31235.6	131400	31200

LIQUEFIED PETROLEUM GAS (LPG) COMBUSTION EMISSIONS CALCULATOR - REVISION D 2/1/2010 - REVISION SCREEN



Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

<u>Version</u>	<u>Date</u>	<u>Author</u>	<u>Revisions</u>
5b-2.0a	4/15/1997	Tony Pendola	Added "LPG" to the title Unprotected cells below Source ID# and at the bottom of the spreadsheet
LPG2002B	7/31/2002	Janet Boyer	Changed outline around lpg parameters to dashed lines to indicate that the user does not need to change these values
LPG2002C	10/30/2008	D. Hayes	Put into new format. Updated criteria pollutant emission factors with the newly revised AP-42 factors (Section 1.5 - July, 2008). Added Greenhouse gas pollutant emissions information.
LPG2010D	2/1/2010	Sushma Masemore	Revised GHG calculations such that the ACTUAL emissions calculated are consistent with the EPA GHG Mandatory Reporting Rule